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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,555	11/15/2001	Masayuki Kimata	Q67299	7542

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EXAMINER

BAYARD, EMMANUEL

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 01/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,555

Applicant(s)

KIMATA, MASAYUKI

Examiner

Emmanuel Bayard

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 5-13 and 15-120 are rejected under 35 U.S.C. 102(e) as being anticipated by Maruta et al U.S. patent No 6,792,033 B1.

As per claims 1 and 11, Maruta et al teaches an adaptive array antenna receiving apparatus, which receives a CDMA, transmitted signal by a plurality of antenna elements (1-1 to 1-N) forming an adaptive array antenna and which includes a predetermined number L of fingers, where L is an integer greater than one, said receiving apparatus comprising (see figs.3-4): a predetermined number L of despread means (3-1-1 to 3-L-N) forming said predetermined number of fingers, each of said predetermined number of despread means being supplied with received signals from said antenna elements for despread the received signals to produce despread signals (see figs.3-4 elements 6k1-6km and col.4, lines 65-67 and col.5, lines 9-15); a predetermined number L of weighting factor multiplying means (4-1 to 4-L) supplied with the despread signals from said predetermined number of despread means, respectively, each of said predetermined number of weighting factor multiplying

means being for multiplying the despread signals by weighting factors to produce a weighted signal (see figs.3-4 element 7 and col.5, lines 16-23); an adder is the same as the claimed (combining means) (see fig.4 element 9 and col.5, lines 18-23) supplied with the weighted signals from said predetermined number of weighting factor multiplying means for adding (combining) (element 9) the weighted signals to produce a rake combined signal; error signal producing means (see fig.4 element 14 and col.5, lines 38-40) supplied with the rake combined signal and a reference signal for calculating a difference between the rakes combined signal and the reference signal to produce a common error signal representative of the difference; and a predetermined number L of control means (5-1 through 5-L) (see figs. 3-4 element 16 and col.5, lines 45-67) supplied with the de-spread signals from said predetermined number of de-spreading means, respectively, and with the common error signal in common and connected to said predetermined number of weighting factor multiplying means, each of said predetermined number of control means being for controlling the weighting factors for each of said predetermined number of weighting factor multiplying means so that a mean square of the common error signal is minimized (see col.5, lines 45-67).

As per claims 2 and 12, Maruta et al does teach a wherein each of said pre-determined number of control means uses an MMSE is the same as the claimed (RLS)(Recursive Least Square) algorithm as an adaptive update algorithm for controlling the weighting factors for each of said predetermined number of weighting factor multiplying means (see col.5, lines 46-55).

As per claims 3 and 13, Maruta et al inherently teaches wherein said reference

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signal is a signal equivalent to a known pilot signal in case where each of the received signals is the known pilot signal.

As per claims 5 and 15, Maruta et al does teach, wherein each of said predetermined number of control means controls the weighting factors (see element 16) for each of said predetermined number of weighting factor multiplying means by the use of an N-order (N being an integer not smaller than 2) correlation matrix (see col.5, lines 9-15 and col.6, lines 40-45) in case where said antenna elements are N in number.

As per claims 6 and 16, Maruta et al does teach wherein said predetermined number of despreading means which form said predetermined number of fingers correspond to a predetermined number L of paths of a multipath of the received signal from each of said antenna elements (see figs.3-4), said receiving apparatus further comprising delay means for delaying (see fig.4 element 15 and col.2, lines 26-40 and col.5, lines 45-67) the received signal from each of said antenna elements by delay times corresponding to the paths of said multipath, respectively, to produce delayed signals which are supplied to corresponding ones of said predetermined number of despreading means, said corresponding ones of the predetermined number of despreading means corresponding to the paths of said multipath.

As per claims 7 and 17, Maruta et al teaches an adaptive array antenna receiving apparatus which receives a CDMA transmitted signal by a plurality of antenna elements (1-1 to 1-N) forming an adaptive array antenna and which includes a predetermined number L of fingers, where L is an integer greater than one, said receiving apparatus comprising (see figs.3-4): a predetermined number L of

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despreading means (3-1-1 to 3-L-N) forming said predetermined number of fingers, each of said predetermined number of despreading means being supplied with received signals from said antenna elements for despreading the received signals to produce despread signals(see figs.3-4 elements 6k1-6km and col.4, lines 65-67 and col.5, lines 9-15)); a predetermined number L of weighting factor multiplying means (4-1 to 4-L) supplied with the despread signals from said predetermined number of despreading means, respectively, each of said predetermined number of weighting factor multiplying means being for multiplying the despread signals by weighting factors to produce a weighted signal (see figs.3-4 element 7 and col.5, lines 16-23); an adder is the same as the claimed (combining means) (see fig.4 element 9 and col.5, lines 18-23) supplied with the weighted signals from said predetermined number of weighting factor multiplying means for adding (combining) (element 9) the weighted signals to produce a rake combined signal; and a predetermined number L of control means (5-1 through 5-L) (see figs. 3-4 element 16 and col.5, lines 45-67) supplied with the de-spread signals from said predetermined number of de-spreading means, respectively, and connected to said predetermined number of weighting factor multiplying means, each of said predetermined number of control means being for controlling the weighting factors for each of said predetermined number of weighting factor multiplying (see col.5, lines 45-67).

As per claims 8 and 18, Maruta et al inherently teaches wherein each of said predetermined number L of control means uses an SMI (Sample Matrix Inversion) algorithm as an adaptive update algorithm for controlling the weighting factors.

As per claims 9 and 19, Maruta et al teaches wherein each of said predetermined number of control means controls the weighting factors for each of said predetermined number of weighting factor multiplying means by the use of an N-order (N being an integer not smaller than 2) correlation matrix in case where said antenna elements are N in number (see fig.4 element 16 and col.5, lines 9-55).

As per claims 10 and 20, Maruta et al does teach wherein said predetermined number of despreading means which form said predetermined number of fingers correspond to a predetermined number L of paths of a multipath of the received signal from each of said antenna elements (see figs.3-4), said receiving apparatus further comprising delay means for delaying (see fig.4 element 15 and col.2, lines 26-40 and col.5, lines 45-67) the received signal from each of said antenna elements by delay times corresponding to the paths of said multipath, respectively, to produce delayed signals which are supplied to corresponding ones of said predetermined number of despreading means, said corresponding ones of the predetermined number of despreading means corresponding to the paths of said multipath.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruta et al U.S. patent No 6,792,03 B1 in view of Tsutsui et al U.S. Patent No

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6,385,181 B1.

As per claims 4 and 14 Maruta teaches all the features of the claimed invention except a deciding means (11) for making a data decision upon the rake combined signal produced by said rake combining means to produce a decision output signal and switching means (12) for selectively switching the decision output signal produced by said deciding means and the reference signal, said switching means being controlled so that, when the received signal is the pilot signal and when the received signal is a data signal other than the pilot signal, the reference signal and the decision output signal are selected, respectively, to be supplied to said error signal producing means.

Tsutsui teaches a deciding means (see fig.18 element 37) for making a data decision upon the rake combined signal produced by said rake combining means to produce a decision output signal and switching means (see fig.18 element 39) for selectively switching the decision output signal produced by said deciding means and the reference signal, said switching means being controlled so that, when the received signal is the pilot signal and when the received signal is a data signal other than the pilot signal, the reference signal and the decision output signal are selected, respectively, to be supplied to said error signal producing means (see col.15, lines 1-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Tsutsui in to Maruta as to select only a beam whose desired wave would be the highest from the multiple beams in order to greatly improve the reception characteristic as taught by Tsutsui (see col.15, lines 60-67).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Rilling U.S. patent No 6,628,969 B1 teaches a one tuner adaptive array.

Maruta et al U.S. patent No 6,665,286 B1 teaches an adaptive receiving device.

Yukitomo et al U.S. Patent No 6,240,149 b1 teaches an adaptive transmission diversity.

Ishii et al U.S. patent No 6,174,584 B1 teaches a CDMA adaptive antenna.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM)
Alternate Friday off.

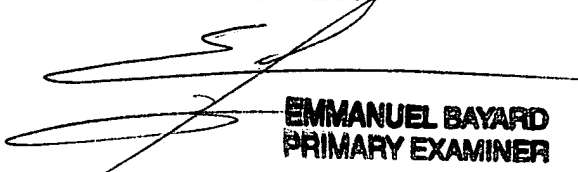
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard
Primary Examiner
Art Unit 2631

1/18/05



EMMANUEL BAYARD
PRIMARY EXAMINER